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10/665,083	09/16/2003	Marvin Glenn Wong	10030290-1	6080

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EXAMINER	
LAZORCIK, JASON L	
ART UNIT	PAPER NUMBER
1731	

DATE MAILED: 06/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/665,083	Applicant(s) WONG, MARVIN GLENN	
	Examiner Jason L. Lazorcik	Art Unit 1731	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09/16/2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) *25-28* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-28* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *09/16/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1 to 24, drawn to a method for forming a channel plate and a method for healing cracks, classified in class 65, subclass 28.

II. Claims 25 to 28, drawn to a switch, classified in class 200, subclass 182.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)).

In the instant case the process as claimed could be utilized in the processing of a materially different product such as a healing defects in an automobile windshield. For instance, a damaged or abraded piece of automobile glass could be repaired by heating the glass between the annealing point and the softening point of the glass, annealing the cracks, and cooling to room temperature.

Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with June Bouscaren on May 9, 2006 a provisional election was made with traverse to prosecute the invention of a method for

healing cracks in an abraded substrate, claims 1 through 24. Affirmation of this election must be made by applicant in replying to this Office action. Claims 25 through 28 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Specification

The disclosure is objected to because of the following informalities: Reference character "102" has been used to designate both "The one or more channels" (Pg 10; ¶ [0033]) and "the substrate" (Pg 10; ¶ [0033]) in the description of Figure 11`

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 5, 7, 14-16, 20, 22, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Case (J. Mater. Sci. 32 (1997) 3163-3175). Briefly, Case (1997) relates an investigation of crack healing in a borosilicate glass using an environmental scanning electron microscope (ESEM).

Specifically with respect to Claim 1, Case (1997) discloses an experimental procedure which comprises the following steps:

1. Abrading a Vickers indent in the center of a borosilicate glass slide (§2.1 ¶1, Pg. 3164)
2. Heating the samples in a tube furnace to a temperature such that the samples are "thermally annealed " (§2.2 ¶2, pg. 3164).
3. and cooling the substrate (§2.2 ¶2, pg.3164)

In the instant case, the process of indenting the surface is held equivalent to the disclosed abrading technique. Similarly, the Vikers indent resulting from the indenting process is held equivalent to the "channel" in the substrate as disclosed in the specification (§[0018]) and defined as a "sort of groove, trough, pit or other feature that creates a recess extending below the uppermost surface of a substrate. While the composition of the commercial glass substrate and therefore the softening point of said material, are not disclosed, it is clear that the quoted temperature of 550°C is well below the softening point of common commercially available borosilicate glasses of the type utilized for microscope slide applications. The heating step is therefore understood to treat the glass substrate at a temperature above the annealing point to induce thermal annealing, but well below the softening point of common borosilicate glasses.

Regarding claims 2, 4, and 5, Case (1997) clearly discloses that the heat treating cycle in the ESEM is to be carried out at a specified relative humidity value (§3.1 ¶2, pg 3165). Since the term relative humidity is well understood and commonly utilized to express water vapor content in air, it is hear understood that the Case (1997) heating

process is carried out in an atmosphere containing water vapor, air, and specifically nitrogen gas in addition to other common components of air.

With specific regard to Claim 2, the heat treating cycle in an atmosphere of specified relative humidity as disclosed by Case (1997) reads directly on the immediate claim as heating a substrate in an environment containing a mixture of nitrogen with water vapor.

Regarding Claim 4, the heat treating cycle in an atmosphere of specified relative humidity as disclosed by Case (1997) reads directly on the immediate claim as heating a substrate in an environment containing air.

Further regarding Claim 5, the heat treating cycle in an atmosphere of specified relative humidity as disclosed by Case (1997) reads directly on the immediate claim as heating a substrate in an environment containing nitrogen gas.

Continuing with claim 7, Case (1997) clearly indicates in the Experimental Procedure (§2.1 ¶1, pg 3164) that the substrates are to be commercially available glass slides (Fisher Scientific Microscope Slides) which read on the immediate claim as a process according to Claim 1 wherein the substrate comprises glass.

Regarding Claims 14 and 15, Case (1997) presents images of pre and post heat treatment substrates as set forth in the following figure. For purposes of this discussion, the Vikers indent as highlighted by the square overlay is equivalent to the claimed macro feature while the cracks annotated by arrows are held equivalent to the claimed micro cracks. It is further understood from the images that the micro cracks emerge on the surface of the substrate resulting in a locally roughened surface.

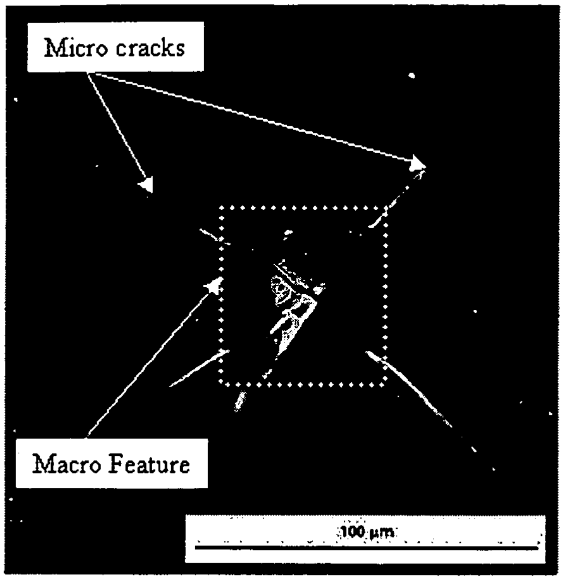

Fig. 1 Pre-heat treatment (pg3165)

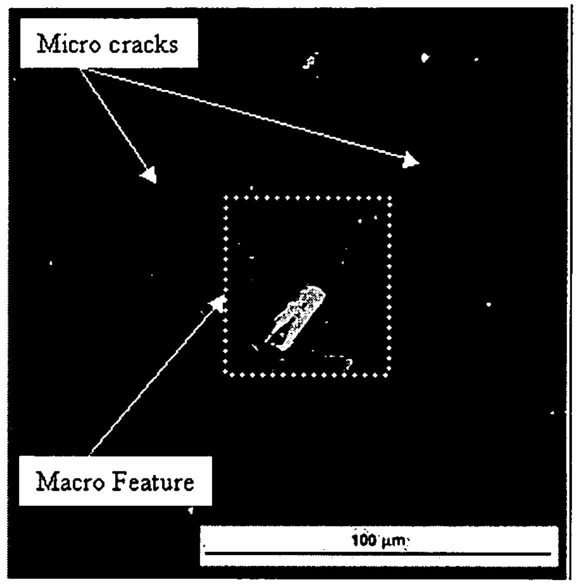

Fig. 2 Post-heat treatment (pg 3166)

Specifically in Claim 14, the assertion is made that the substrate is heated to a temperature that heals micro cracks while minimizing sagging of macro features. From the above figure, it is clear the Vikers indent (square overlay) remains relatively unchanged from pre to post heat treatment, while the micro cracks (arrows) display a marked decrease in length or "healing" from the same treatment cycle.

Further in Claim 15, it is asserted that the substrate is to be heated to a temperature that smoothes the surface of the substrate without disturbing the macro features. Again, the Vikers indent (square overlay) remains relatively unchanged or "undisturbed" during the heat treatment cycle, while the cracks (arrows) are healed and decrease in length producing a locally smoothed surface in the healed region of the original crack.

Regarding Claim 16, Case (1997) clearly indicates in Table III (See following excerpt from page 3165) which recites experimental data in experiment gamma, that the

first ESEM heat treatment cycle is to be for a period of 59.25 min (ramp 25°C to 370°C @ 20°C/min in 17.25min followed by a 15 min dwell and ramp 370°C to 430°C @ 5°C/min in 12min followed by a 15min dwell). This set of process steps clearly read on the instant claim as heating the substrate for a period of time in the range of approximately ten to one hundred and twenty minutes.

TABLE III ESEM hot stage heating schedule for specimen in experiment gama

	Set point (°C)	Ramp rate (°C min^{-1})	Dwell time (min)
1	370	20	15
2	430	5	15
3	25[a]	20[a]	[a]
4	370	20	15
5	430	10	175

[a]ESEM shut down, so specimen was cooled to room temperature and the ESEM was rebooted.

With respect to Claim 20 and referring to the Claim 16 rejection, Case (1997) in the Table III data indicates that the substrate is to be heated in hot stage heating schedule step 1 from a temperature of 25oC at a ramp rate of 20oC/min. It is understood in this context that the ESEM is held functionally equivalent to the claimed furnace. Therefore this experimental procedure reads clearly on the instant claim as heating the substrate in a furnace wherein the temperature is ramped from 25°C at a rate of about 20°C to 40°C per minute.

Similarly regarding Claim 21 and referring to the Claim 20 rejection, Case (1997) in the Table III data indicates that the substrate is to be cooled in hot stage heating schedule step 3 from a temperature of 430°C to 25°C at a ramp rate of 20°C/min.

Therefore this experimental procedure reads directly on the instant claim as a process according to Claim 20 wherein the substrate is cooled to 25oC at a ramp rate of about 20°C to 40°C per minute.

With respect to Claim 22, all claimed elements have been previously anticipated by a combination of the arguments set forth in the rejections of Claims 1 and 14 above. Specifically, the Claim 1 rejection set forth a process for heating a substrate to a temperature between the annealing point and the softening point of the substrate material followed by cooling said substrate. Claim 14 clearly indicated that these process steps result in healing cracks or "micro cracks" in said substrate

Claim 23 is fully anticipated by a in light of the above rejection of Claim 22 and the rejection of Claim 2 which indicated that the thermal treatment is to be carried out in an atmosphere containing a mixture of nitrogen with water vapor.

Claim 6 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Tarr (J Biomed Mater Res (Appl Biomater) 48:791-796, 1999) hereafter referred to as Tarr (1999). The immediate reference teaches the abrasion of a ceramic block by indenting a Vickers indent to produce an abraded channel in the ceramic block or substrate. The Vickers indent is held equivalent to the claimed "channel" under the same premise set forth in the Claim 1 rejection above. Tarr (1999) continues (§ Materials and Methods; Specimin Preparation – pg 792) by annealing the abraded ceramic substrate (Cerec Vitablocs Mark II) in air at 900°C between the glass transition point [796 +/- 5oC] and the softening point [914 +/- 8°C] (see §Results; Thermal Expansion- pg 792) followed by

cooling to room temperature. This set of experimental procedures reads on claim 6 as a method of Claim 1, wherein the substrate comprises ceramic.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 3 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Case (1997) as applied to the respective claims 1/2 and 22/23 above, and further in view of Case (J. Mater. Sci. 34 (1999) 247-250) hereafter referred to as Case (1999). Case (1997) teaches all of the elements of Claims 1,2 and 22,23 by forming a channel in a substrate, heating the substrate material between its annealing point and softening point in an atmosphere comprising nitrogen and water vapor, and cooling the substrate back to room temperature. Case (1997) does not teach that the concentration of water

vapor in said atmosphere should lie between 10 to 25%, nor does it teach that the relative humidity in the chamber should fall approximately 5% below the saturation value.

Case (1999) examined the effect of humidity on crack healing as a function of healing temperature. In brief, it was disclosed that the temperature at which crack healing initiated shifted as a function of relative humidity (§3.1 ¶1, pg 248). Specifically samples exposed to increasingly higher initial humidities or water vapor concentrations displayed onset of crack healing at progressively lower temperatures.

"[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."; see In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation (See In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) and In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977)). In light of the disclosure in Case (1999) that the temperature at which crack healing initiated decreased as a function of relative humidity and therefore percentage water vapor in the atmosphere, the relative humidity is considered a result-effective variable. It would have been obvious with respect to Claim 3 and Claim 24 for one of ordinary skill in the art at the time of the invention to optimize the relative humidity in the heating chamber. Optimization of this result effective

variable would have been undertaken in order to minimize the onset temperature for crack healing thereby minimizing the overall thermal stress to the sample.

Claims 8, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Case (1997) as applied to claim 1/7 above, and further in view of the materials information sheet for Corning 1737 AMLCD Glass Substrate data sheet hereafter referred to as Materials Information Sheet (1737). Case (1997) teaches all of the elements of Claim 7 and by extension Claim 1 in forming a channel in a substrate comprised of borosilicate glass, heating the substrate material between its annealing point and softening point, and cooling the substrate back to room temperature. Case (1997) does not teach that the substrate should be of the specific type of alkaline earth boro-aluminosilicate glass marketed by Corning under the trade name Corning 1737. The Materials Information Sheet (1737) indicates that a principle use for this formulation of glass is as a substrate for active matrix panel displays. It would have been obvious to utilize the process as set forth by Case (1997) in order to heal micro crack damage incurred in the fabrication of active matrix displays fabricated from Corning 1737 alkaline earth boro-aluminosilicate glass in order to improve product yield.

With respect to claim 9 and in further view of the claim 8 rejection above, the active matrix display substrate fabricated from Corning 1737 should be heated to above it's annealing point but below its softening point as taught by Case (1997). Case does not relay the particular temperature range claimed, however the Materials Information Sheet (1737) indicates an annealing point of 172°C and a softening point of 975°C. It would have been obvious to one of ordinary skill attempting to heat a substrate

fabricated from Corning 1737 between its annealing point and softening point to do so in a range of about 721°C to 975°C.

Claim 10 continues the argument set forth in the Claim 9 rejection above. Specifically, a combination of Case (1997) and the Corning Materials Information Sheet (1737)fully anticipate all elements of Claim 9. Case (1997) sets forth the set of experimental parameters for experiment alpha as laid out in Table I (see below) wherein the maximum temperature is maintained for a period of 135 minutes (dwell time). This set of experimental parameters reads on the instant claim as maintaining the maximum heating temperature for at least ten minutes.

TABLE I ESEM hot stage heating schedule for specimen in experiment alpha

	Set point (°C)	Ramp rate (°C min^{-1})	Dwell time (min)
1	300	20	5
2	400	20	10
3	500	10	20
4	550	5	30
5	600	2	135

Further, although Case (1999) does not set forth Corning 1737 as the substrate material, it does expose the empirical relationship between the dwell time at a maximum healing temperature and the resultant decrease in the crack length. This data set clearly sets forth dwell time at a given maximum temperature as a result effective variable as per the argument set forth in the Claim 3 and 24 rejections above. It would have been obvious to one of ordinary skill in the art to empirically optimize the dwell time at a maximum heating temperature in the process set forth by Case (1997) in order to minimize crack length in an active matrix display substrate made from Corning 1737.

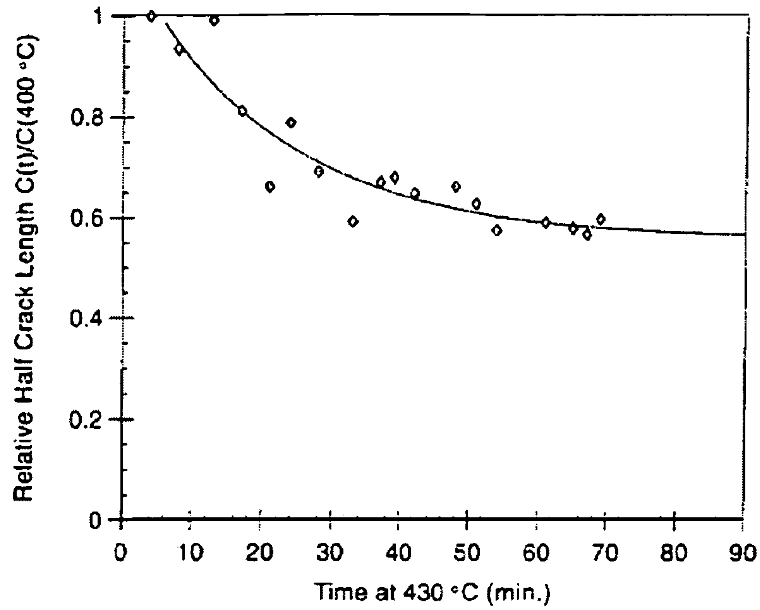

Figure 5 Relative change in crack length ($c(T)/c(400\,^{\circ}C)$) as a function of time at 430 °C for a glass specimen initially held at 32% r.h. Data points indicate ESEM measurements of the four half-indent cracks. The curve is a least-squares best-fit of the data to Equation 4.

Claims 11, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Case (1997) as applied to Claims 1 and 7 above, and further in view of the Corning Materials Information sheet for Pyrex 7740 Borosilicate Glass hereafter referred to Materials Information Sheet (7740).

Specifically regarding Claim 11, Case (1997) teaches all of the elements of Claim 7 and by extension Claim 1 in forming a channel in a substrate comprised of borosilicate glass, heating the substrate material between its annealing point and softening point, and cooling the substrate back to room temperature. Case (1997) does not teach that the specific composition of the borosilicate glass comprising the substrate should be of the exact type of glass marketed by Corning under the trade name Corning 7740

(Pyrex®) and described as the "industry standard" in the Materials Information Sheet (7740). It would have been obvious to one of ordinary skill in the art to substitute the "industry standard", specific composition of borosilicate glass marketed under Corning 7740 for the generic borosilicate glass described in the procedure set forth by Case (1997) to heal micro cracks in said Corning 7740 glass substrate.

With respect to claim 12 and in further view of the claim 11 rejection above, Case (1997) clearly teaches that the substrate fabricated from borosilicate glass should be heated to above it's annealing point but below its softening point. Case (1997) further sets forth at least two sets of experimental data (§3.1, Table I – experiment alpha and Table IV – experiment delta) wherein said substrate is heated to the temperatures of 600°C and 610°C. The Materials Information Sheet (7740) indicates an annealing point of 560°C and a softening point of 821°C for Corning 7740 glass. The combined teachings of Case (1997) and Materials Information Sheet (7740) would render obvious to one of ordinary skill attempting to heat a substrate fabricated from Corning 7740 between its annealing point and softening point and to do so in a range of about 560°C to 821°C.

Claim 13 continues the argument set forth in the Claim 12 rejection above. Specifically, a combination of Case (1997) and the Corning Materials Information sheet (7740) fully anticipate all elements of Claim 12. Case (1997) sets forth the set of experimental parameters for experiment alpha as laid out in Table I (see below) wherein the maximum temperature is maintained for a period of 135 minutes (dwell time). This

set of experimental parameters reads on the instant claim as maintaining the maximum heating temperature for at least ten minutes.

TABLE I ESEM hot stage heating schedule for specimen in experiment alpha

	Set point (°C)	Ramp rate (°C min^{-1})	Dwell time (min)
1	300	20	5
2	400	20	10
3	500	10	20
4	550	5	30
5	600	2	135

Further, although Case (1999) does not set forth Corning 7740 as the substrate material, it does expose the empirical relationship between the dwell time at a maximum healing temperature and the resultant in the crack length. Specifically an increase in the dwell time at a maximum temperature results directly in reduced crack length (see Figure) This data set clearly sets forth dwell time at a given maximum temperature as a result effective variable as per the argument set forth in the Claim 3 and 24 rejections above. It would have been obvious to one of ordinary skill in the art to empirically optimize the dwell time at a maximum heating temperature in the process set forth by Case (1997) in order to minimize crack length in a substrate fabricated from Corning 7740.

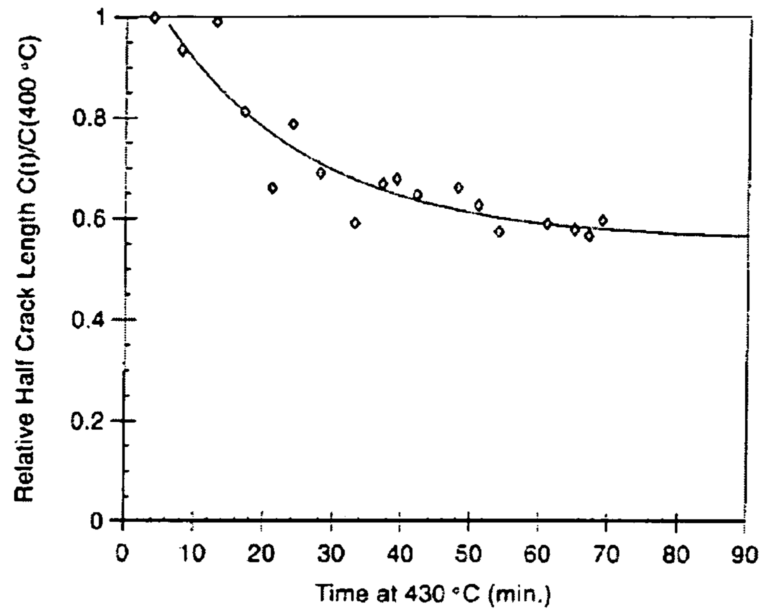

Figure 5 Relative change in crack length ($c(T)/c(400\ ^{\circ}C)$) as a function of time at 430 °C for a glass specimen initially held at 32% r.h. Data points indicate ESEM measurements of the four half-indent cracks. The curve is a least-squares best-fit of the data to Equation 4.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Case (1997) in view of Danilatos (Micros Res and Tech 25:354-361 (1993)) hereafter referred to as Danilatos (1993). Case (1997) teaches all of the elements of Claim 1 as outlined above, however it fails to explicitly set forth the orientation of the substrate in the ESEM during the heating and cooling cycles. In Figure 1 (see following excerpt from pg 355) of Danilatos (1993), the structure of a common ESEM is disclosed with the electron gun oriented normal to the sample specimen stub. Given that the pictures displayed in Case (1997) (see specifically Figs 1, 2, 7, and 8) are all plan views of the substrate and channel surface, and that the substrate was heated in the ESEM chamber as outlined in the various experimental trials alpha through gamma (see §3.1, pg 3165), and the

electron gun is oriented normal to the surface by Danilatos (1993), the substrate must have been oriented with the "at least one channel" facing towards the electron gun when heated. It would have therefore been obvious to one of ordinary skill in the art at the time of the invention to utilize an ESEM as described in Danilatos (1993) to perform the procedure as set forth in Case (1997) such that the at least one channel was facing up when heated in order to acquire a plan view electron micrograph of a healing cracks on channel surface.

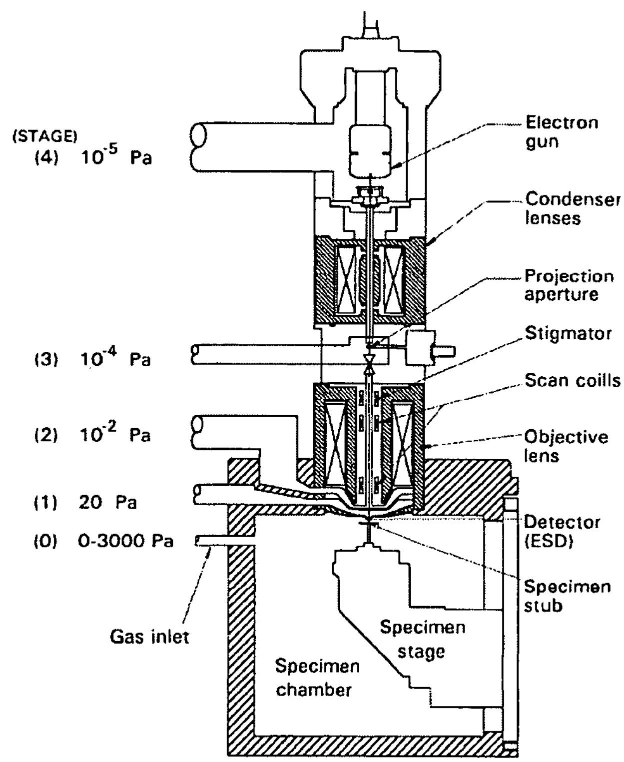

Fig. 1. ElectroScan ESEM model 20 (Type-3 electron optics column).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Case (1997) in view of Danilatos (1993) as applied to claim 17 above, and further in view of Zworykin (ASTM Bull 117, 15-23 (1942a)) hereafter referred to as Zworykin (1942). Case (1997) in view of Danilatos (1993) teaches all the elements of claim 17 while

failing to explicitly set forth the restriction where at least one channel faces down when heated. Specifically Danilatos teaches a situation where the electron source is located above and normal to the sample when acquiring an electron micrograph of the substrate surface. Danilatos therefore teaches that the substrate is broadly understood to "face-up" when an image is acquired. Since Case (1997) teaches that an electron micrograph is to be acquired of the "channel" when heating the sample in the temperature range between the annealing point and softening point of the substrate (Fig 2, pg 3166), it is understood that the at least one substrate channel is "facing up when heated". Zworykin (1942) teaches an electron microscope configuration wherein the electron source is located below the specimen mount while still held normal to the surface (see excerpt of figure 7 below).

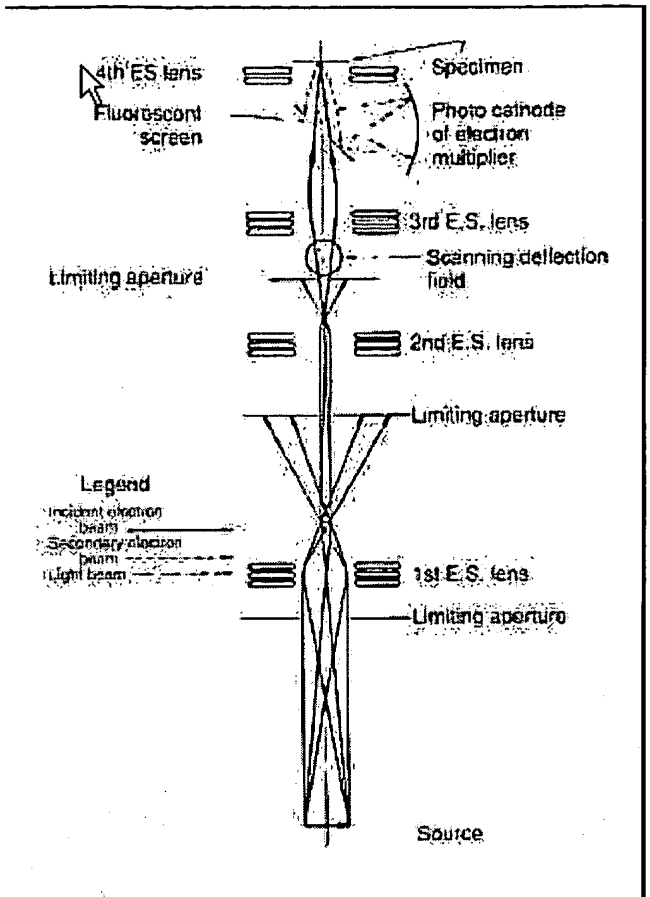

Fig. 7. The electron optics of the SEM built by Zworykin et al. (1942a).

It would be obvious to one of ordinary skill in the art to image channel on a heated substrate surface as set forth by the Case (1997) in view of Danilatos (1993) method but as modified to make use of the functionally equivalent Zworykin (1942) inverted style electron microscope. Imaging in this functionally equivalent, inverted style electron microscope by the Case (1997) process would therefore necessitate that the at least one channel is facing down during the heating process as claimed.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Case (1997) as applied to claim 1 above, and further in view of the Michigan State University SEM Sample Holder Instruction Sheet hereafter referred to as MSU (2003). Case

(1997) teaches all the elements of claim 1 wherein the sample heating takes place in an environmental SEM while failing to explicitly set forth the restriction that during heating, the sample is supported on a polished, low-porosity substrate. MSU (2003) lays out a method of fabricating a SEM sample mount from a block of brass to secure a sample during imaging without the contamination problems (or sample creep) associated with carbon tape. Specifically Step 9 sets forth that the stage surface can be "polished as desired" and is therefore understood to present a polished, low-porosity surface to said sample. It would therefore be obvious to one of ordinary skill in the art to modify the Case (1997) method to incorporate a sample mount stage as described in MSU (2003) in order to avoid contamination of the sample surface.

Conclusion

The art made of record and not relied upon is considered pertinent to applicant's disclosure. Particular note is made of Brandes (US 6,926,592 B2) wherein disclosure is provided with respect to a method of treating the surface of mechanically abraded (sandblasted) glass through heating the substrate in the region of the softening point.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Lazorcik whose telephone number is (571) 272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLL

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